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(54) Fire resistant cable

(57) In a multi-core electric cable, each conductor is provided with a layer of inorganic material (for example comprising tapes of sheet material consisting of mica paper supported on an open weave glass fabric) which forms a carbon-free insulating layer on combustion, and further with a layer of elastomer-based insulating compound (for example ethylene-propylene based rubber) over the inorganic-material layer. The conductors, together with a bare earth wire, are enclosed within a sheath comprising a laminate of thermoplastic polymeric composition/metal foil and an extruded sheathing of a polymeric composition around the laminate, the metal layer of the laminate facing inwards and contacting the earth wire throughout

the cable length. On exposure to fire, the ethylene propylene rubber is destroyed but the mica paper remains intact to maintain adequate electrical resistance between the conductors.

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SPECIFICATION

Fire resistant cable

5 This invention relates to an electric cable having good fire resistant properties.

This invention is a modification of or improvement in the invention which is the subject of our British patent 1 500 121.

10 Our British patent 1 500 121 describes and claims a multi-core electric cable, which comprises two or more electric conductors, each of which is insulated with a coating of silicone rubber insulation, a bare earth wire, and a sheath consisting of a laminate of a thermoplastic polymeric composition/aluminium or copper foil and an extruded sheathing of a fire retardant polymeric composition around the laminate, the sheath enclosing the insulated conductors and the earth wire with the metal layer of the laminate on the inside and in contact with the earth wire throughout the length of the cable. Such cable construction is suitable for cables in which the cross-sectional area of each conductor is up to 4 square millimetres and which comprises from 2 to 19 separate conductors. By way of example, such cable may be used for 2 and 5 pair 0.5 mm² telephone and signal cables for use in high fire risk areas, such as in power stations, and is suitable for surface mounting.

The present invention provides a multi-core electric cable, which comprises two or more electric conductors, each provided with a layer of an inorganic material which forms a carbon-free insulating layer on combustion and provided with a layer of elastomer based insulating compound over said inorganic material layer, a bare earth wire, and a sheath consisting of a laminate of a thermoplastic polymeric composition/metal foil and an extruded sheathing of a polymeric composition around the laminate, the sheath enclosing the insulated conductors and the earth wire with the metal layer of the laminate on the inside and in contact with the earth wire throughout the length of the cable. The metal foil may comprise aluminium, copper, steel or other suitable metal. The extruded sheathing of polymeric composition will generally be fire retardant, but this may not always be necessary, particularly when the foil metal is steel.

The layer of organic material forming a carbon-free insulating layer on combustion preferably comprises tapes of a sheet material consisting of mica paper supported on an open weave glass fabric, which tapes are wound spirally around each conductor with a suitable overlap, or longitudinally formed around the conductor. The elastomer based insulating compound layer preferably comprises an extruded layer of ethylene-propylene based rubber insulation. Other materials such as cross-linked polyethylene, butyl rubber or thermoplastic rubber may be used provided

that the layer has the required electrical properties, moisture resistance necessary to protect the mica paper from a deterioration of its own electrical resistance, and mechanical properties to cushion the mica-paper tapes. Mica paper supported on open weave glass fabric is available commercially.

When exposed to fire, the ethylene propylene rubber is destroyed but the mica paper remains intact and maintains adequate electrical resistance between adjacent conductors.

CLAIMS

1. A multi-core electric cable, which comprises two or more electric conductors, each provided with a layer of an inorganic material which forms a carbon-free insulating layer on combustion and provided with a layer of elastomer-based insulating compound over said inorganic material layer, a bare earth wire, and a sheath comprising a laminate of a thermoplastic polymeric composition/metal foil and an extruded sheathing of a polymeric composition around the laminate, the sheath enclosing the insulated conductors and the earth wire with the metal layer of the laminate on the inside and in contact with the earth wire throughout the length of the cable.

2. A cable as claimed in claim 1, in which the extruded sheathing of polymeric composition is fire retardant.

3. A cable as claimed in claim 1 or 2, in which the layer of an inorganic material on each conductor comprises tapes of a sheet material comprising mica paper supported on an open weave glass fabric.

4. A cable as claimed in any preceding claim, in which the elastomer-based insulating compound layer on each conductor comprises an extruded layer of ethylene-propylene based rubber insulation.

5. A cable as claimed in any one of claims 1 to 3, in which the elastomer-based insulating compound layer on each conductor comprises cross-linked polyethylene, butyl rubber or thermoplastic rubber.

6. A multi-core electric cable as claimed in claim 1 and substantially as herein described.